Keywords for Today’s lesson

What do the following words mean? Relate them digital device and give examples where possible

1. **Interference**
2. **Connection**
3. **Consumption**
4. **Tethering**
5. **Range**

Keywords for Today’s lesson

What do the following words mean? Relate them digital device and give examples where possible

1. **Interference –** the action of preventing a device from working correctly
2. **Connection –** link between two or more digital devices
3. **Consumption -** the action of using up a resource.
4. **Tethering -** the linking of digital devices to a smartphone in order to connect to the internet.
5. **Range –** The distance covered between devices

Wireless Connection Methods

TOPIC 2 – TRANSMITTING DATA

UNIT 1 – INFORMATION TECHNOLOGY SYSTEMS

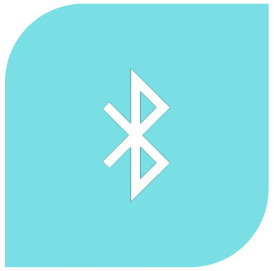
Wireless Connection

This allows us to transmit data wirelessly

We can connect to the internet, transfer data between devices & use peripherals without any physical wires.

Wireless Connection

INFRARED



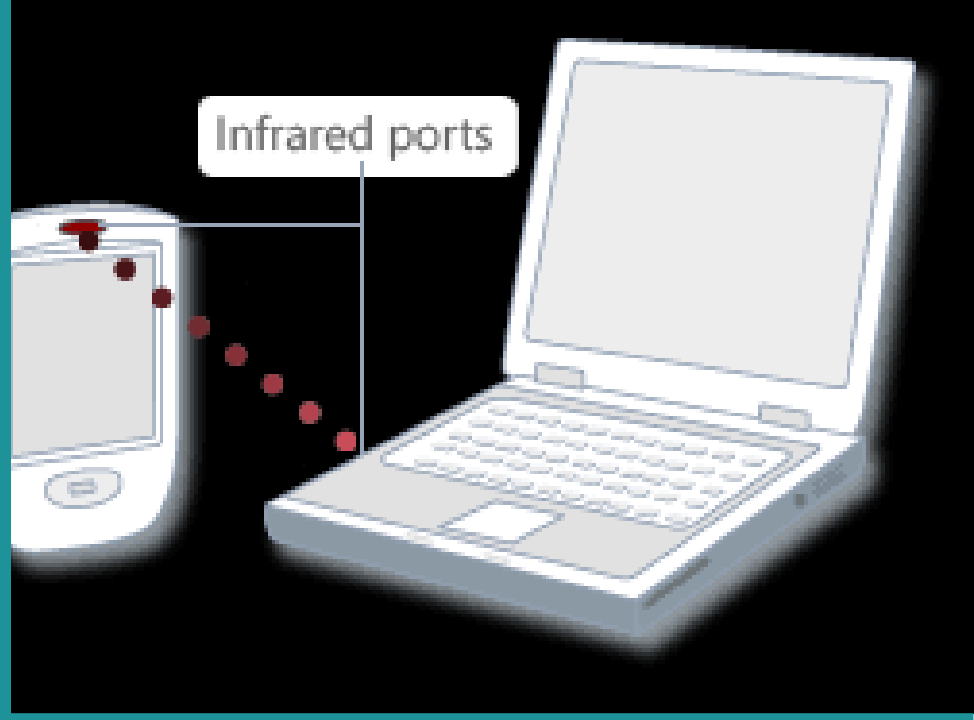
BLUETOOTH

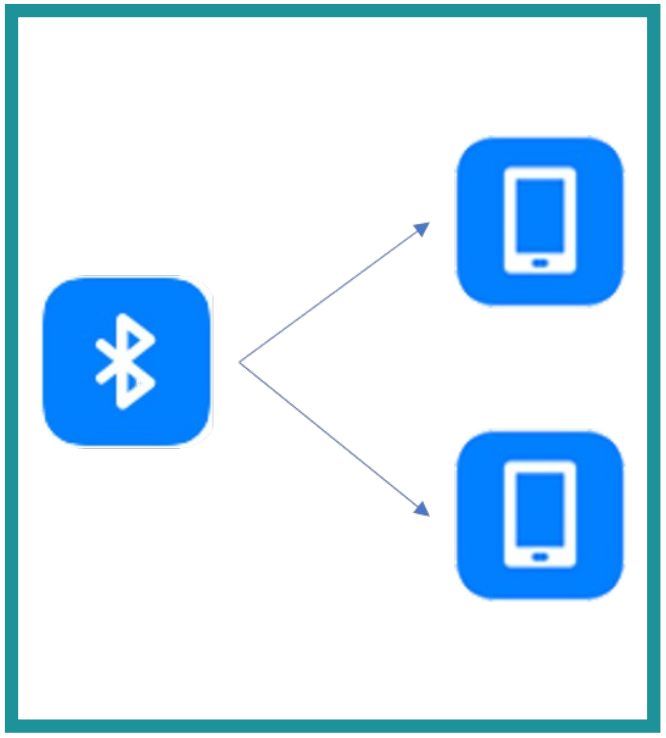
WIFI

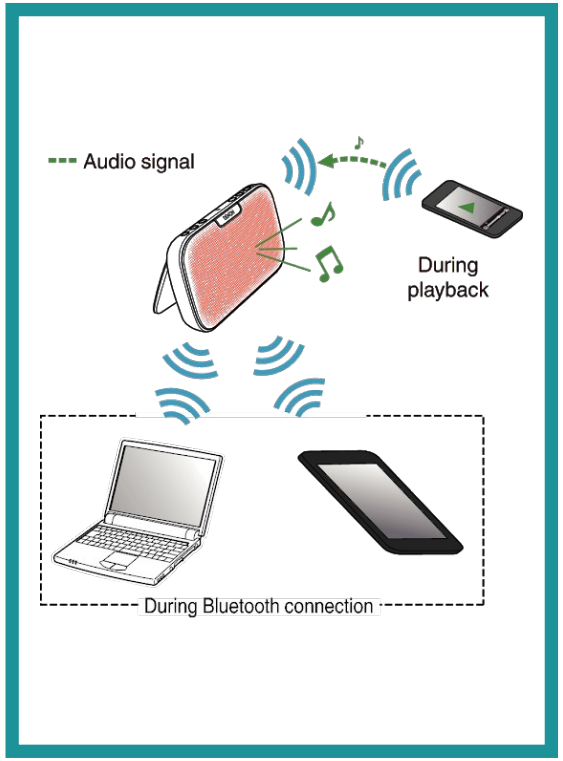
MOBILE BROADBAND

Infrared

- Commonly used with remote controls.
- Previously used with peripheral devices like wireless mice & keyboard, but not as much anymore.
- It has a low susceptibility to interference.
- However, it is short ranged, requires line of sight and is slow.

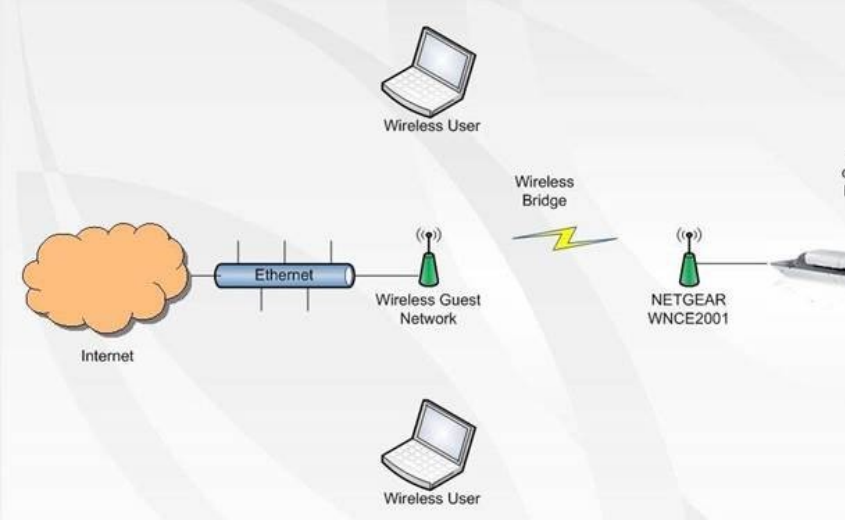






Bluetooth

- Commonly used with peripheral devices like wireless mice & keyboards.
- It’s also used to transfer data between two digital devices and to share a mobile broadband connection.
- It is easy to connect, has a low susceptibility to interference and has a low power consumption.
- However, it is also relatively slow and not very secure.



Wifi

- Used to access the internet, create a wireless LAN and to connect to some peripherals such as printers.
- It is relatively fast and long ranged and has a low installation cost.
- However, it can be complex to set up and insecure.

Mobile Broadband

Mobile broadband is a mobile connection that is used with mobile devices to access the internet on the go.

It is widely available wherever you are and is very easy to connect to.

However, it is expensive and is quite a bit slower than WiFi connections.

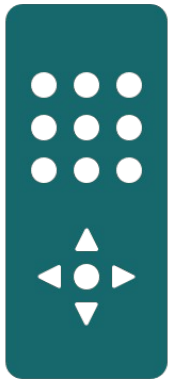
Notes Activity – 20 mins

1. Look through additional slides in the PowerPoint on Wireless Connections

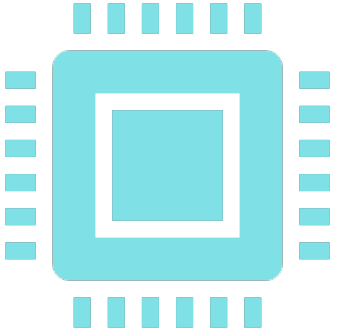
2. Add **additional** notes for each wired connection **- 2 Bullet Points minimum**

3. Add **1 additional advantage** and **1 disadvantage** for each wired connection

Infrared



This is a technology that transmits data through infrared light. We usually see it used in remote controls such as your TV remote. It was commonly used with connecting peripheral devices to a PC, such as a mouse or a keyboard, however, nowadays Bluetooth is more common for this.



Similarly, it could also be used to transfer data between devices. This would be most commonly used to sync a mobile device with a personal computer. However again, Bluetooth is much more common for this now.

Infrared – Advantages

Low susceptibility to interference.

Infrared connects to devices ‘one-to-one’ and so it’s less likely to be interfered with by another device.

Not being a radio technology, it also isn’t susceptible to electromagnetic interference.

Infrared – Disadvantages

It can only transmit data over very short distances. The maximum range is around 5 metres.

Infrared also requires line of sight. This can make transmitting data problematic if there are obstacles in the way that make it difficult to gain a direct view.

Its data transmission speed is very slow. The maximum speed is around 4 Mbps. This is much slower than other wireless technologies.

Bluetooth

This is a very popular wireless technology that uses microwaves to transmit data. It is commonly used for connecting peripheral devices, such as mice & keyboards, to your computer without any cables. It replaced the older RFID & infrared technology for this due to it having a longer range & faster transfer speed.

Another use of Bluetooth is with mobile technology to create a personal area network (PAN) to sync our files on our mobile devices with our personal computers. We can also use it to connect our mobile devices to our personal computer to make use of the 4G mobile broadband connection. This is known as “tethering”.

Bluetooth is now used very commonly, even by non-technical IT users. So much so that wireless Bluetooth headphones now outsell wired headphones and the recent iPhone release didn’t even offer a headphone jack.

Bluetooth – Advantages

Easy to connect devices with. It is fully automated and once a connection is setup devices will connect when they come in range.

Low susceptibility to interference. This is very good at avoiding interference due to its low-grade signal and frequency hopping.

Low power consumption due to the low power signal it uses. This is particularly useful for mobile devices that run on battery.

- Relatively slow data transfer speed. While faster than infrared, the maximum speed of Bluetooth is just 25 Mbps. This is much slower than WiFi for example, as well as most wired alternatives.
- Poor security compared to other methods, such as WiFi. This is partly due to its automatic connection which can allow others to transfer data to your device. This has been improved in recent versions, but still has security vulnerabilities that can be exploited.

Bluetooth – Disadvantages

WIFI

This is the most commonly known form of wireless connection, particularly when transmitting data between computer systems. We most often use it to connect to a wireless access point in order to gain access to the internet as well as to connect wirelessly to a local area network.

However, we now use WiFi for more than just this. For example, we can also use WiFi to connect our computer to certain peripherals, most notably a printer, and to sync our computer to a mobile device.

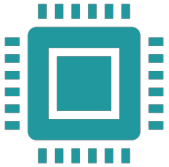
WiFi technology has changed massively over the years. Early versions of WiFi could only transfer data at speeds of 2 Mbps. The latest versions of WiFi are theoretically capable of just under 7 Gbps. That’s 3000x faster in just 20 years.

WiFi has become such an important connection method that most devices now have WiFi capability built into them.

WIFI – Advantages

Fast data transfer speeds. Compared to other wireless technologies, WiFi is very fast. It is theoretically capable of just under 7 Gbps. However, WiFi devices are more commonly capable of max speeds of around 2.5 Gbps.

Relatively large range. WiFi can transmit data over a range of around 70 metres. This compares very well against other wireless technologies.



Low-cost installation. The devices are inexpensive and compared to a wired network you don’t need masses of cabling.

WIFI – Disadvantages

Complexity in setting up WiFi can be an issue. It requires you to correctly configure a wireless access point which can be difficult for inexperienced IT users.

Security can be a big issue, as with most wireless connection methods. If configured correctly WiFi can be more secure than most but if poorly configured, such as not setting a complex WiFi key, then it can be very vulnerable to hackers.

Mobile Broadband

Mobile broadband is a general term we use to cover the 3G/4G internet we access wirelessly through a cellular connection. This is commonly used to access the internet while on the go, such as while commuting to work, via a mobile device.

As mentioned in the Bluetooth section, we can tether our mobile devices to our personal computers so that we can use our mobile broadband on our personal computers. We can also purchase a mobile broadband dongle that connects to our computer via USB in order to gain mobile broadband connectivity.

Mobile broadband is becoming more and more popular over recent years and we're seeing connections increase in speed and prices start to come down. Between 2015 and 2016 the number of people in the UK using 4G internet increased from 23.6 million to 39.5 million. A year earlier less than 3 million people were using 4G.

Mobile Broadband – Advantages

- Internet access is available almost everywhere. 4G coverage is very good throughout the UK. Where 4G isn’t available, 3G almost always is.

- It’s an easy to use method of connecting to the internet. It requires no additional setup or configuration in order to access it.

Mobile Broadband – Disadvantages

Mobile broadband is very expensive compared to other methods of accessing the internet. You can find yourself paying £20+ for just 4GB a month downloading.

Data transfer speeds are also usually quite a bit slower than other internet connection methods. 4G usually achieves around 12 Mbps, though more is possible in right conditions. 3G is also around a tenth of the speed of 4G.

Wireless Connection Summary

Infrared is a wireless connection that is commonly used with remote controls. It was also commonly used with peripheral devices like wireless mice & keyboard, but not as much anymore. It has a low susceptibility to interference. However, it is short ranged, requires line of sight and is slow.

Bluetooth is a wireless connection that is commonly used with peripheral devices like wireless mice & keyboards. It's also used to transfer data between two IT systems and to share a mobile broadband connection. It is easy to connect, has a low susceptibility to interference and has a low power consumption. However, it is also relatively slow and not very secure.

WiFi is a wireless connection that is used to access the internet, create a wireless LAN and to connect to some peripherals such as printers. It is relatively fast and long ranged and has a low installation cost. However, it can be complex to set up and insecure.

Mobile broadband is a mobile connection that is used with mobile devices to access the internet on the go. It is widely available wherever you are and is very easy to connect to. However, it is expensive and is quite a bit slower than WiFi connections.